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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,047	09/25/2003	Timothy N. Obee	60246-217	6648
26096 7590 06/22/2007 CARLSON, GASKEY & OLDS, P.C. 400 WEST MAPLE ROAD SUITE 350 BIRMINGHAM, MI 48009			EXAMINER MAYEKAR, KISHOR	
			ART UNIT 1753	PAPER NUMBER
			MAIL DATE 06/22/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/671,047	Applicant(s) OBEE ET AL.	
	Examiner Kishor Mayekar	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9/03 & 2/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of invention of Group I, claims 1-28 in the reply filed on 5 April 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Objections

2. Claim 10 is objected to because of the following informalities: the recitation "said substrate, and said photocatalytic ..., and said ... are located" is incorrect. Should it be better as --wherein said substrate, said photocatalytic ..., and said ... are located--? Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Art Unit: 1753

4. Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 8 recites one of the metal oxide is Mn_xO_2 , however fails to define what the variable x is.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2, 3, 8 and 19-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 2, the recitation "said energy" lacks antecedent basis.

In claim 3, the recitation "said energy" lacks antecedent basis.

In claim 8, the recitation " Mn_xO_2 " is indefinite since the variable x is not defined.

In claim 19, the recitation "said desired wavelength" lacks antecedent basis.

In claim 20, the recitation "said desired wavelength" lacks antecedent basis.

In claim 21, the recitation "said desired wavelength" lacks antecedent basis.

In claim 22, the recitation "said desired wavelength" lacks antecedent basis.

Claim Rejections - 35 USC § 102 and § 103

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 2, 4, 5, 9-12, 14-20, 23-25 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Kataoka et al. ("Photocatalytic oxidation in the presence of microwave irradiation: observations with ethylene and water", Journal of Photochemistry and Photobiology A: Chemistry, Volume 148, pp. 323-330, May 31 2002), a reference cited by Applicant. Kataoka discloses a study on the influence of microwave irradiation on the photocatalytic oxidation of a test compound, ethylene, in a gas phase on a photocatalyst of TiO_2ZrO_2 mixed oxide thin films (see abstract). In the Introduction section, Kataoka

Art Unit: 1753

discloses that the photocatalytic oxidation is known as an air purification technology. In the Experiment section, Kataoka discloses a coating of the photocatalyst on a substrate and the ethylene in air. The study indicates that the microwave irradiation removes water from the catalyst surface better than when heat is applied by conductive means, especially in Approach 2 (see conclusion starting on page 329).

As to the subject matter of each of claims 10 and 11, Kataoka discloses it in Fig. 1 and 2, respectively.

As to the subject matter of claim 14, it is inherent in Kataoka's study.

As to the subject matter of claim 17, Kataoka discloses in the Experiment section.

As to the subject matter of each of claims 18-20 and 23, it is inherent in Kataoka's study.

10. Claims 14 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka. The difference between Kataoka and the instant claims is the intended use of the system. The subject matter as whole would have been within the level of ordinary skill in the art at the time the invention was made to have modified Kataoka's teachings because the manner or method in which such system is to be utilized is not germane to the issue of patentability of the system itself.

11. Claims 3, 13, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable

Art Unit: 1753

over Kataoka in view of Obee et al. (US 6,358,374 B1), another reference cited by Applicant. The differences between Kataoka and the instant claims are the provision of the radiowave as the energy source and the use of an ozone generating lamp. Obee shows in an air purification system the use of infrared irradiation and microwave in addition to heater as a heat source (col. 5, lines 4-17) and the use ozone generating lamps as the light source (col. 5, lines 55-57). The subject matter as whole would have been within the level of ordinary skill in the art at the time the invention was made to have modified Kataoka's teachings as shown by Obee because the selection of any of known equivalent heating means to desorb the adsorbed water or light source to activate the photocatalyst would have been within the level of ordinary skill in the art.

12. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka in view of Kobayashi et al. (US 6,68,668 B1). The differences between Kataoka and the instant claims are the limitations in each of the instant claims. Kobayashi teaches in a photocatalytic material that each of the limitations (col. 3, lines 63-67 and col. 5, line 53 through col. 6, line 26). The subject matter as whole would have been within the level of ordinary skill in the art at the time the invention was made to have modified Kataoka's teachings as shown by Kobayashi because the selection of any of known equivalent photocatalyst would have been within the level of ordinary skill in the art and the provision of the metal oxide would increase the efficiency of the photocatalyst.

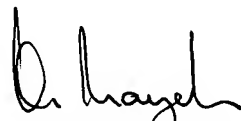
Art Unit: 1753

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Kishor Mayekar
Primary Examiner
Art Unit 1753